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(54) **Flip-up type seat.**

(57) A flip-up type seat has a seat member support (11, 21), a seat member, and a seat member coupling mechanism (13) interposed between the seat member support and the seat member to couple the seat member to the seat member support in such a way that the seat member can be freely moved between its horizontal seated position and its vertical

flipped-up position. The seat member coupling mechanism cause the rear end of the seat member to be moved up and down in the vertically direction and the front end thereof forward and backward in the horizontal direction when the seat member is moved between its seated position and its flipped-up position.

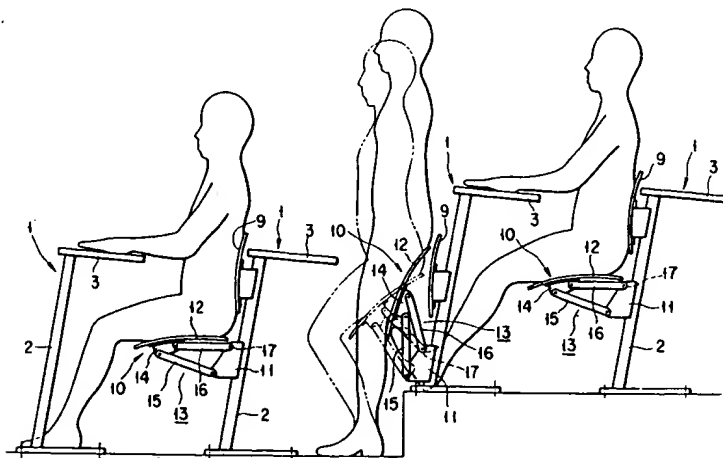


FIG. 1

in order to allow a person to pass through between the user and the lift-up type seat 10 of the front line.

In a case that the user taking standing pose leans himself or herself against the seat member 12 of the flip-up type seat 10 which has been flipped up, the user's clothes contacts the upper surface of the seat member 12 which has been directed forward. This prevents the user's clothes from being soiled and broken by the seat member 12 which has been flipped up. In addition, since the user contacts the seat member 12 through its upper surface having large area, the user cannot feel any pain even when the user leans for a long time himself or herself against the seat member 12 which has been flipped up.

Since the lower surface of the seat member 12 directs backward while the seat member 12 is in its flipped-up position, the upper surface of the seat member 12 which has not been used does not be soiled by shoes of the user who is now seated on the seat 10 in the behind line even if the flip-up type seats 10 are set on the stepped floor, as shown in Fig. 12.

Figs. 3 and 4 shows a theater seat 20 of the flip-up type seat according to a second embodiment of the present invention.

The theater seat 20 includes a pair of side boards 21 fixed on the floor at a certain interval. These paired side boards 21 are used as legs, and construct seat member support. Their upper surfaces are used as arm support members for a person who is seated on the seat 20.

Both sides of a cushioned seat back 29 are fixed to rear end portions of the paired side boards 21 with the seat back 29 being tilted backward a little.

First and second guide grooves 25 and 24 are formed in each of opposed inner surfaces of the paired side boards. The first guide groove 25 extends linearly and substantially parallel to the cushioned seat back 29 at a position near to the seat back 29, and the second guide groove 24 is positioned in front of the first guide groove 25 and is arched with its rear end being higher than its front end.

A cushioned seat member 22 is positioned between the paired side boards 21, and guide rods 27 and 26 extending from both sides of the cushioned seat member 22 at its rear and middle portions are inserted into the first and second guide grooves 25 and 24 of the paired side boards 21.

When the rear end guide rod 27 and the middle portion guide rod 26 are positioned at the rear ends of the corresponding first and second guide grooves 25 and 24, the cushioned seat member 22 is located at its flipped-up position in which its front end directs downward, its rear end directs upward

and its upper surface directs forward.

A gas spring 28 is connected to both the guide rod 27 of the rear end of the cushioned seat member 22 and the corresponding one side board 21. The gas spring 28 urges upward the rear end of the cushioned seat member 22.

When the user sits down on the seat member 22, while putting his or her buttocks on the rear end of the cushioned seat member 22 which has been flipped up, the rear end guide rod 27 is forced downward along the first guide groove 25 and the rear end of the cushioned seat member 22 is also moved downward against the gas spring 28. At the same time, the middle portion guide rod 26 is guided forward along the second guide groove 24, and the front end of the cushioned seat member 22 is moved forward.

When the guide rod 27 reaches the lower end of the first guide groove 25 and the guide rod 26 reaches the front end of the second guide groove 24, the cushioned seat member 22 of the seat 20 is located at its substantially horizontal seated position.

Since the rear end of the cushioned seat member 22 which has been at its seated position is urged upward by the gas spring 28, the guide rod 27 is forced upward along the first guide groove 25 and the rear end of the seat member 22 is thus moved upward when the user stands up from his sitting pose. At the same time, the middle portion guide rod 26 is guided backward along the second guide groove 24 and the front end of the seat member 22 is thus moved backward. The seat member 22 is thus finally located at its flipped-up position.

In this embodiment, the guide rod 27 of the rear end portion of the cushioned seat member 22, the guide rod 26 of the middle portion thereof, and the first and second guide grooves 25 and 26 to which the guide rods 27 and 26 are inserted, construct seat member coupling means 23 for moving the cushioned seat member 22 between its flipped-up position and its seated position. Same merits as those in the case of the above-described student seat 10 for the student desk according to the first embodiment of the present invention can be achieved by the theater seat 20.

Figs. 5 through 7 show a workman's seat 30 which is according to a third embodiment of the flip-up type seat of the present invention, and which is suitable for draftman, for example.

A leg 31 which serves as a seat member support of the workman's chair 30 is constructed by a pipe member which is fixed to a floor to extend upward. A rod-shaped piston member 35 is inserted into the leg 31 to be freely slidable up and down. Means 36 for urging the piston member 35 upward is interposed between the lower end of the

piston member 35 and that of the leg 31. In this embodiment, the urging means 36 is constructed by a compression coil spring.

The upper end of the piston member 35 is connected to the rear end portion of the lower surface of a seat member 32 so as to be pivotable in the vertical direction. Paired swingable members 34 are connected at one end of each of them to the right-handed or left-handed front end portions of the lower surface of the seat member 32, and connected at the other ends to the upper end portion of the leg 31 so as to be pivotable in the vertical direction.

When the workman's chair 30 is not used, the piston member 35 is urged upward by the urging means 36. The rear end of the seat member 32 is thus moved upward and the front end thereof backward by the action of the paired swingable members 34. As the result, the seat member 32 is located at its flipped-up position in which its rear end directs upward, its front end directs downward and its upper surface directs forward.

When the user sits down, putting his or her buttocks on the upward directed rear end of the seat member 32 which has been located at its flipped-up position, the rear end of the seat member 32 moves downward the piston member 35 against the urging force of the urging means 36 and the front end of the seat member 32 is pushed forward by the action of the paired swingable members 34. The seat member 32 is thus finally located at its substantially horizontal seated position.

Since the seat member 32 which has been located at its seated position is urged upward at its rear end by the urging means 36, the piston member 35 is moved upward in the leg 31 to move the rear end of the seat member 32 upward when the user stands up from his sitting pose. At the same time, the paired swingable members 34 act to move backward the front end of the seat member 32. The seat member 32 is thus located at its flipped-up position.

In this embodiment, the piston member 35 of the rear end portion of the seat member 32 and the paired swingable members 34 of the front end portion of the seat member 32 serve as seat member coupling means 33 for moving the seat member 32 between its flipped-up position and its seated position.

Same merits as those in the case of the above-described student seat 10 for the student desk according to the first embodiment of the flip-up type seat can also be achieved by the workman's seat 30.

When a valve lock type gas spring is used as the urging means 36 in the workman's seat 30, the seat member 32 can be stopped at any desired angle between its flipped-up position and its seated

position. When a working table 1A such as the drawing board is used at a desired angle, therefore, the seat member 32 can be set at any angle suitable for the workman to stably work at the working table 1A.

Plural casters can be attached to the lower end of the leg 31 through support members, the workman's seat 30 can be freely moved on the floor.

Figs. 8 through 10 show a vehicle seat 40 which is according to a fourth embodiment of the flip-up type seat of the present invention and which is suitable for use in vehicles such as the commuters' train.

A pair of vertically extending support frames 41 which serve as a seat member support for the vehicle seat 40 are fixed to the wall of a coach of a train so as to be separated at a predetermined distance from each other. A cushioned seat back 49 is also fixed to the wall of the coach between the upper end portions of the paired frames 41.

A guide groove 45 is formed in each of the paired support frames 41 to extend vertically from the upper end of its corresponding frame to a position adjacent to the lower end thereof. A pair of guide rods 46 fixed to the rear end portions of both side surfaces of a seat member 42 are inserted into their corresponding guide grooves 45. One end portion of each of a pair of swingable members 44 is vertically pivotable connected to the corresponding one of the lower end portions of the paired support frames 41, and the other end portions thereof are vertically pivotably connected to the front end portion of the lower surface of the seat member 42. Urging means 48 such as a gas spring is interposed between one of the paired guide rods 46 and the floor of the coach to urge the rear end of the seat member 42 upward through the above described one of the guide rod 46.

When the vehicle seat 40 having the above-described arrangement is not used, the paired guide rods 46 of the rear end portion of the seat member 42 are urged by the urging force of the urging means 48 to be moved to the upper ends of the paired guide grooves 45 in the paired support frames 41, and the front end of the seat member 42 is moved backward by the action of the paired swingable members 44. As the result, the seat member 42 is located at its flipped-up position in front of the cushioned seat back 49 to be laid along the wall of the coach with its rear end directing upward, its front end directing downward and its upper surface directing forward.

When the user sits down, putting his or her buttocks on the upward directed rear end of the seat member 42 which has been at its flipped-up position, the rear end portion of the seat member 42 is moved downward to force the paired guide

rods 46 downward along the guide grooves 45 in the paired support frames 41 against the urging force of the urging means 48, and the front end portion thereof is pushed forward by the action of the paired swingable members 44. As the result, the seat member 42 is located at its substantially horizontal seated position.

When the user stands up from his or her sitting pose, the rear end portion of the seat member 42, which has been located at its seated position and is urged upward at its rear end portion by the urging force of the urging means, is moved upward with the paired guide rods 46 being moved upward along the paired guide grooves 45 of the paired support frames 41, and the front end portion thereof is drawn backward by the action of the paired swingable members 44. The seat member 42 is finally located at its flipped-up position.

In this embodiment, a combination of the paired guide rods 46 of the rear end portion of the seat member 42 and the paired guide grooves 45 of the paired support frames 41 into which the guide rods 46 are inserted, and the paired swingable members 44 construct seat member coupling means 43 for moving the seat member 42 between its flipped-up position and its seated position.

Same merits as those in the case of the student seat 10 for the student desk according to the first embodiment of the flip-up type seat can also be achieved by the vehicle seat 40.

Claims

1. A flip-up type seat comprising:
 - a seat member support (11, 21, 31, 41);
 - a seat (12, 22, 32, 42); and
 - a seat member coupling means (13, 23, 33, 43) interposed between said seat member support and said seat member to couple said seat member to said seat member support in such a way that said seat member can be freely moved between its seated position where it is kept substantially horizontal and its flipped-up position where it is kept substantially vertical, characterized in that said seat member coupling means (13, 23, 33, 43) cause the rear end of said seat member (12, 22, 32, 42) to be moved up and down in the vertical direction and the front end thereof forward and backward in the horizontal direction when said seat member is moved between its seated position and its flipped-up position.
2. The flip-up type seat according to claim 1, characterized in that said seat member coupling means (13) includes link means constructed by two arms (15, 16) both ends of each of which being pivotably connected to

said seat member supports (11, 21) and to said seat member (12) with the connecting points of said two arms on said seat supports being separated from each other and those on said seat member being also separated from each other.

3. The flip-up type seat according to claim 2, characterized in that said seat member coupling means (13) includes means (17) for urging at least one of said two arms (15, 16) upward.
4. The flip-up type seat according to claim 1, characterized in that said seat member coupling means (23) includes a pair of guide grooves (24, 25) formed in at least one of said seat member support (21) and said seat member (22), and a pair of guide rods (26, 27) mounted on the other of them and guided by the guide grooves.
5. The flip-up type seat according to claim 4, characterized in that said seat member coupling means (23) includes means for urging the rear end of said seat member (22) upward.
6. The flip-up type seat according to claim 1, characterized in that said seat member coupling means (33) includes a vertically movable member (35) having one end portion pivotably connected to a position of said seat member (32) near the rear end thereof, and the other end portion vertically movably supported on the seat member support (31), and a swingable member (34) having one end portion pivotably connected to a position of said seat member (32) located in front of the above described one end portion of the vertically movably member, and the other end portion pivotably connected to said seat member support (31).
7. The flip-up type seat according to claim 6, characterized in that said seat member coupling means (33) includes means (36) for urging the rear end of said seat member (32) upward.
8. The flip-up type seat according to claim 6, characterized in that said seat member support (31) has a vertically extending pipe member, said vertically movable member (35) of said seat member coupling means (33) is a piston member vertically slidably supported by said pipe member, and the other end portion of said swingable member (34) of said seat member coupling means is pivotably connected to said pipe member.

9. The flip-up type seat according to claim 8, characterized in that means (36) for urging said piston member (35) of said seat member coupling means (33) upward is arranged in said pipe member (31) so that the rear end of said seat member is urged upward. 5
10. The flip-up type seat according to claim 1, characterized in that said seat member coupling means (43) includes a vertically extending guide groove (45) formed in said seat member support (41), a guide rod (46) mounted at a position of said seat member (42) near the rear end thereof and guided its movement by the guide groove (45) of said seat member support (41), and a swingable member (44) having one end portion pivotably connected to a position of said seat member in front of said guide rod and the other end portion pivotably connected said seat member support. 10 15 20
11. The flip-up type seat according to claim 10, characterized in that said seat coupling means (43) includes means (48) for urging the rear end of said seat member (42) upward. 25

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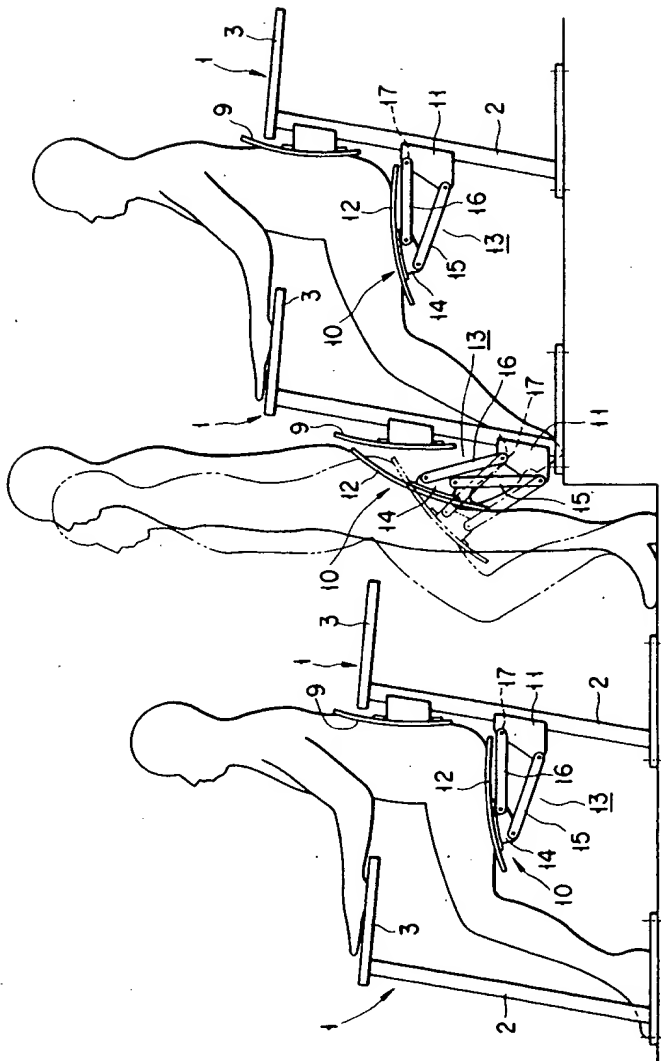


FIG. 1

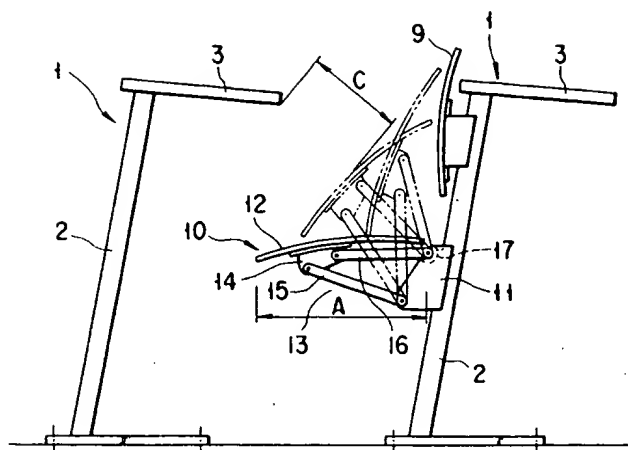


FIG. 2

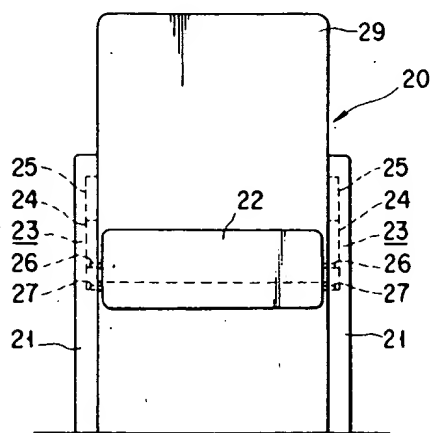


FIG. 3

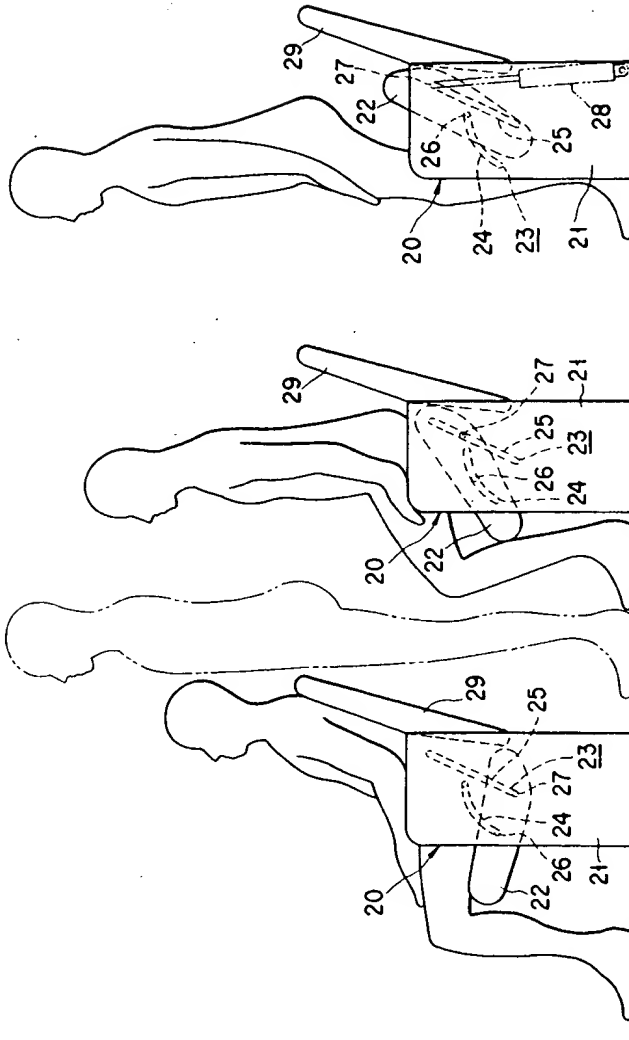


FIG. 4

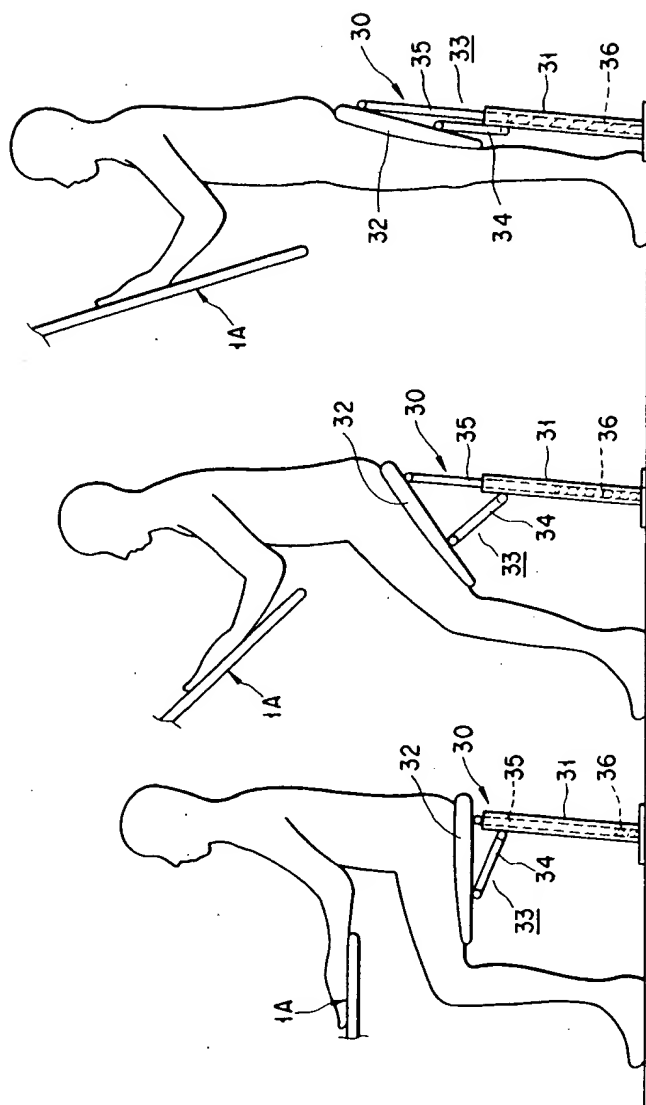


FIG. 5

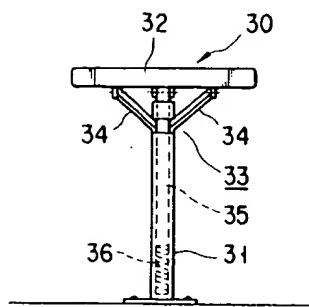


FIG. 6

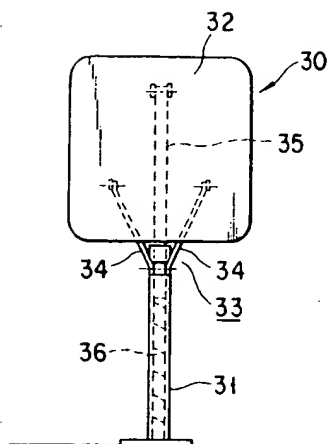


FIG. 7

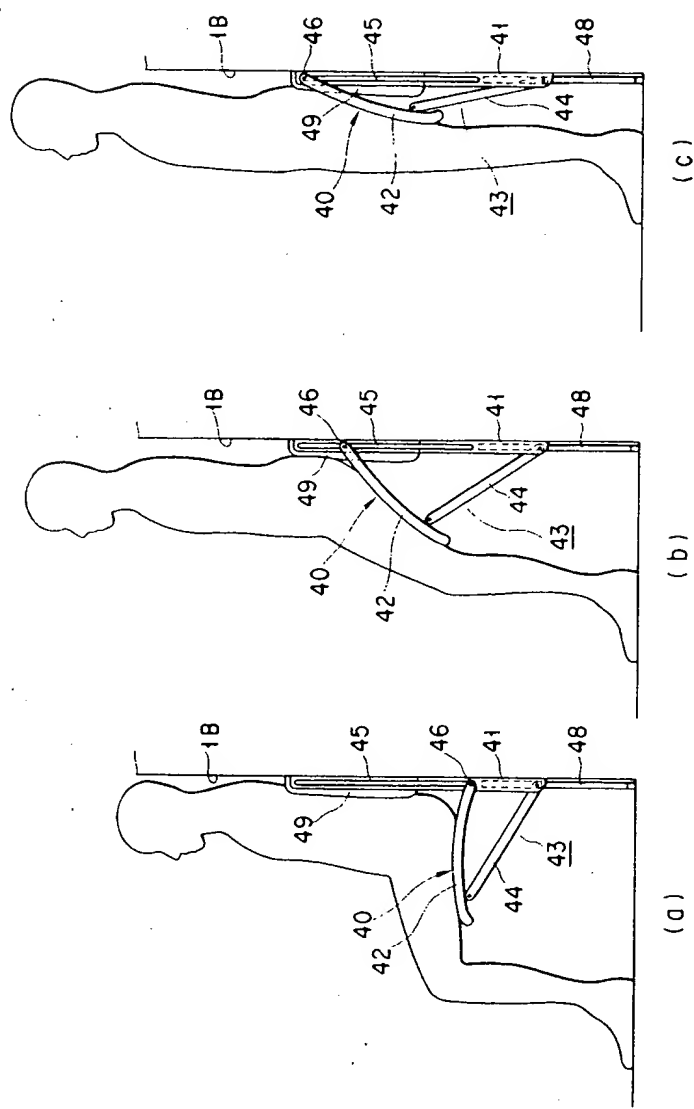


FIG. 8

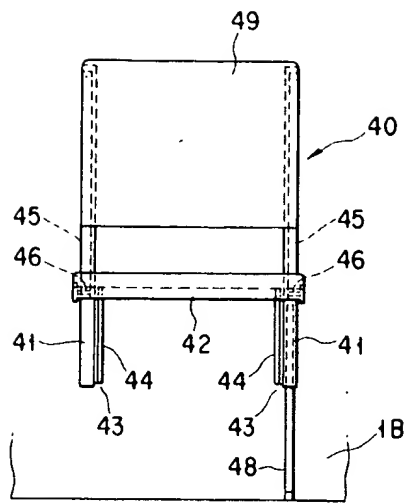


FIG. 9

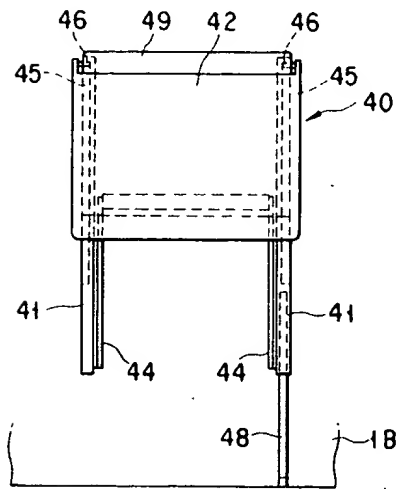


FIG. 10

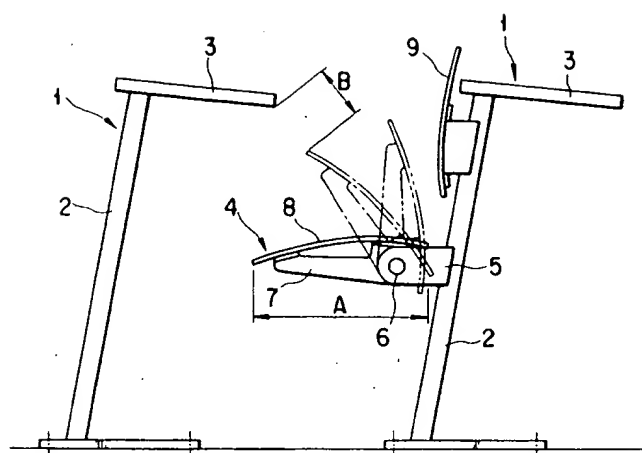


FIG. 11

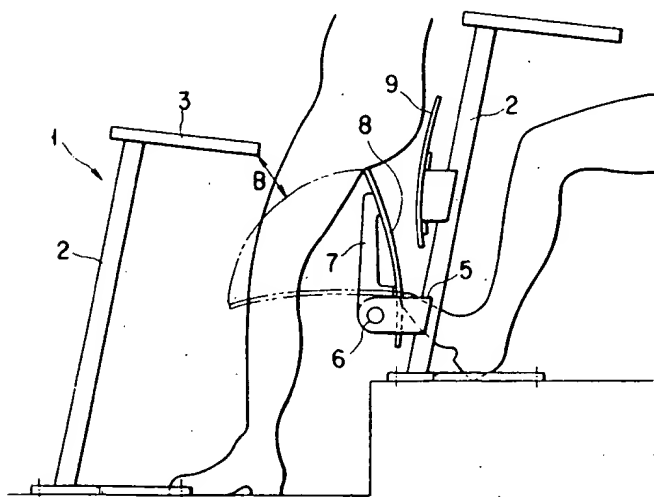


FIG. 12



European Patent
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EUROPEAN SEARCH REPORT

Application Number

EP 92 10 9888

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-1 509 863 (ERICKSON) * page 1, line 44 - page 2, line 2 * * page 2, line 26 - line 77 * * figures 1,2,6,10 * ---	1,2,3	A47C7/56 A47C9/06
X	US-A-1 761 673 (LAURSEN) * page 1, line 60 - page 2, line 28; figures 1-4,6-8 *	1,10	
A	---	2,4,6	
X	US-A-1 428 018 (ERICKSON) * the whole document *	1,2,3	
A	---	6,7,8	
A	US-A-3 116 091 (BETHOON) * column 2, line 5 - column 3, line 13; figures 1-3 * -----	6,7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A47C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 19 AUGUST 1992	Examiner VANDEVONDELE J.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- A : member of the same patent family, corresponding document	